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ABSTRACT

Much earlier controversy surrounding the Chinese "ba" construction stems from dissention over whether or not "ba" has any independent semantic content. "Ba" was assumed either to be a purely formal particle whose function was to assign case, or to have semantic content translating into thematic content. However, under the hypothesis that abstract case does not play a role in Chinese, "ba" can not be a case marker. It is also argued that thematic content can not be assumed. Instead, a second kind of thematic information that plays a role in syntactic description, namely event structure, is hypothesized. It is shown that the affected interpretation of the "ba" dependent phrase is the consequence not of a particular thematic role but of the a-role assigned by "ba." Thus the constraints on "ba" are captured and shown to be intrinsically linked. It is concluded that this provides further evidence for a model of syntax in which there is considerable interaction between the syntactic representation and the level of event structure. Contains 19 references. (MSE)

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Catrin Siân Rhys

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EVENT STRUCTURE AND THE *BA* CONSTRUCTION*

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1. Introduction

The controversy surrounding the *ba* construction within Chinese linguistics concerns the semantic content of *ba* and its relation to the matrix verb. On the one hand, it is argued to be a full lexical preposition, independently assigning a thematic role to its complement (Li 1985, Cheng 1986). On the other hand, it is claimed to be a dummy Case marker with no semantic content, inserted to license the direct object of the verb (Huang 1982, Goodall 1987). Constraints on *ba* and the interaction of *ba* with more general syntactic constraints in Chinese have the effect that the well formedness of *ba* fronting ranges from obligatory through preferred and optional to ill-formed. In its simplest form, however, the *ba* construction is an optional mechanism for fronting the object of a transitive verb:

(1) a. ta sha le fuqin.
he kill ASP father.
He killed his father.

b. ta *ba* fuqin sha le.
he father kill ASP.
He killed his father.

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Under early assumptions in GB, the conclusion that the *ba* object was moved also forced the conclusion that *ba* itself was a semantically empty dummy Case marker inserted at S-structure, because of the Theta Criterion. Previous analyses have therefore tended to concentrate on the properties of the movement operation and the contexts in which it was obligatory.

With the advent of theories of functional heads, *ba* can be viewed as a base generated functional head with independent semantic properties but crucially no thematic grid. The constraints on the licensing of the *ba* construction then move to centre stage, as the properties of the functional head and its complement are determined. This is the approach taken in this paper. *Ba* is given a novel analysis in which it interacts with the thematic structure of matrix verb via a system of thematic mediation, but more importantly, it interacts with event structure via the hierarchy of aspectual roles proposed in Grimshaw (1990). This dual interaction allows us to capture both the formal aspects of *ba*, that have lead to its treatment as a dummy Case marker, and the interpretive effects of *ba*, which have lead to its analysis as a thematic head. Furthermore, I show that the analysis developed here has some interesting results for the argument structure of the *ba* construction, in addition to the desired effect of accounting for the relation between an affectedness constraint on the DP following *ba*, and the aspectual restrictions on the verb phrase in the *ba* construction.

Before investigating the constraints on the licensing of *ba*, the structure assumed for the *ba* construction is outlined along with some motivating data.

2. What is the structure of the *ba* construction?

The first observation to be made about the *ba* construction is that the apparent object of *ba* canonically gets its thematic role from the verb and appears in the post verbal complement position, as shown in the simple *ba* construction given in (1b) which relates to the canonical order in (1a) (repeated here):

(1) a. ta sha le fuqin.
she kill ASP father
She killed her father.

b. ta ba fuqin sha le.
she *ba* father kill ASP
She killed her father.

This suggests that *ba* is not a thematic role assigner and that the apparent object of *ba* is not a complement of *ba*, or at least is not assigned a thematic role by *ba*. This suggestion is strengthened by the observation that *ba* and its apparent object do not behave as a constituent with respect to movement. The following examples show that they cannot appear either postverbally, or sentence initially, or outside VP.[1]

(2) a. *ying lin sha le ba muqin.
Ying Lin kill ASP *ba* mother

b. *ba muqin ying lin sha le.
Ba mother Ying Lin kill ASP

c. *ying lin ba muqin zuotian yong dao shasi le.
Ying Lin *ba* mother yesterday use knife kill ASP

It should be noticed in this context that the apparent object of *ba* is licensed to appear in all the above positions without *ba*. It can also even appear in the preverbal *ba* position without *ba*, which suggests that in addition to not being a thematic role assigner, *ba* is not simply an inserted Case assigner.[2]

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[1] See Y. H. A. Li (1985: 373) for more detailed argumentation that *ba* occupies a position within VP.

[2] Although of course an alternative interpretation of this fact is that when the object does appear in the *ba* position without *ba*, there is a null Case assigner, carrying the focus interpretation of the construction. However, the question of Case assignment in Chinese is not one I wish to address in this paper (see Rhys 1992). It has also been pointed out to me by a reviewer that it is not clear that the unmarked preverbal object is in fact in the same position as *ba*, since interaction with adverbials points to the unmarked preverbal object being outside VP.

If *ba* and its apparent object do not form a constituent, what, then, is the constituent structure involved? An important observation in this case is that *ba* imposes aspectual restrictions on the VP that follows it. So the following example is ruled out because the VP is stative and not perfective as required by *ba*.[3]

(3) *wo ba ta ai.
I *ba* her love

This relationship of *ba* to the VP, and the fact that it does not assign a thematic role to its apparent object, point to a structure in which the actual complement of *ba* is in fact the VP. Indeed *ba* does appear to behave like other functional heads that have a VP complement, in that the position of *ba* is fixed, as shown in (2), and iteration of *ba* is not licensed. Hence in the following example, either object of the double object verb *jiao* 'spray' can be *ba* fronted, but not both:

(4) a. ta ba hua jiao le shui.
he *ba* flowers spray ASP water
He sprayed the flowers with water.

b. ta ba shui jiao le hua.
he *ba* water spray ASP flowers
He sprayed the water on the flowers.

c. *ta ba hua ba shui jiao le.
he *ba* flowers spray ASP water
He sprayed the flowers with water.

In addition, reduplication of *ba* in the A-not-A structure, as in (5), shows that it is a verbal head in the verbal projection since only verbs

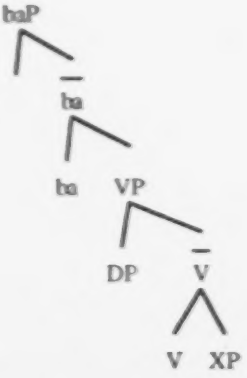
[3] This is a simplification of the aspectual restrictions as will become clear below.

can be negated by the negative particle *bu* that appears in the A-not-A reduplication:[4]

(5) ni ba bu ba shu gei ta?
you *ba* not *ba* book give her

The evidence thus points to the following structure in which *ba* is a functional head with a VP complement. The apparent object then appears in the specifier of the VP complement governed by *ba*, but not theta marked by *ba*.[5] Henceforth this DP will be referred to as the *ba* DP, and *not* the *ba* object.

(6)



The relation between *ba* and the *ba* DP, is taken to be one of thematic mediation (see Rhys 1992 for motivation for such an analysis). The idea of thematic mediation comes from Grimshaw's discussion of the role of the prepositions *to* and *of* in licensing the

[4] It has been pointed out by a reviewer that prepositions such as *gen* 'with' might also arguably be negated by *bu*. In Rhys 1992, however, I have argued that precisely this set of putative prepositions are in fact also verbal functional heads interacting with the thematic structure of the matrix verb.

[5] Note that this rules out adoption of any simple view of the VP internal subject hypothesis of Koopman and Sportiche 1991. For discussion of this see Rhys 1992.

arguments of nominals (Grimshaw 1990: 71). This idea is developed in Adger and Rhys (forthcoming), in which lexical heads have both argument structure and thematic structure and the Generalised Theta Criterion requires that thematic roles be assigned to arguments. In this approach, a thematic mediator is a functional head with argument structure but no thematic structure, which licenses a thematic role from a lexical head which either has no argument structure (e.g. nominals), or has an argument saturated by something other than the thematic role (e.g. nominal gerunds). It is this relationship of thematic mediation (and the a-role structure of *ba* to be discussed below) that gives the appearance of constituenthood to *ba* plus the *ba* DP, and yields the adjacency requirement of *ba* and the following VP, ruling out certain kinds of typical VP behaviour, e.g. coordination, VP-initial adverbs, etc.

3. Aspect and the constraints on *ba* fronting

With the exception of Cheng (1986), early accounts (e.g. Huang 1982) have concentrated on the structural properties of *ba* , and the contexts in which it is obligatory. The constraints on *ba* fronting have been assumed to be peripheral; a matter of semantics or even pragmatics. These accounts have therefore not attempted to explain the ungrammaticality of examples such as:

(7) * wo ba yige qianbao shi le.
I *ba* a purse find ASP

(8) * wo ba ta ai.
I *ba* her love

(9) * wo ba ji kanjian le.
I *ba* chicken saw ASP

(10) * wo ba qian you.
I *ba* money have

The unacceptability of (7) relates to the definiteness of the *ba* DP, which is generally claimed to be necessarily definite, but in this

example is marked as indefinite by the indefinite article *yige*. The problem in (8) is one of aspect: *ba* fronting is not licensed when the verb constellation is stative. Both (9) and (10) are generally explained in terms of an affectedness restriction on *ba* DP, although (10) also does not meet the aspectual constraints on *ba* since the verb *you* 'have' is clearly stative.

Ba also interacts with the Postverbal Constraint (Huang 1982), the syntactic constraint on word order that makes object fronting obligatory when another constituent, whether complement or adjunct, appears in the postverbal position:

(11) a. wo ba ta mian le zhi.
I *ba* him cancel *le* job
I fired him.

b. *wo mian le zhi ta.
I cancel *le* job him

c. *wo mian le ta zhi.
I cancel *le* him job

Thus *ba* fronting may be obligatory (under the Postverbal Constraint), optional (in the simple *ba* construction as in (1)), ungrammatical (with certain aspectual classes), or preferred (in the resultative constructions to be discussed below).

Earlier GB accounts have generally acknowledged these descriptive generalisations about the *ba* construction but have taken the constraints on *ba* to be outwith the scope of a syntactic account. In the case of the definiteness restriction, it is certainly the case that this restriction is not specifically a property of the *ba* construction. Firstly, it is a more general property of word order in Chinese that preverbal NPs have a definite or specific interpretation whereas postverbal NPs have an indefinite interpretation. Thus in the case of ergative verbs where the subject is licensed either preverbally or postverbally, the difference in interpretation between the two subject positions is one of definiteness (examples from Sybesma 1992):

(12) a. tankeche lai le.
tanks come le
The tanks have come.

b. lai tankeche le.
come tanks le
There are some tanks coming.

It might also be argued that this definiteness restriction is the effect of the communicative function of *ba* which is to mark the object as 'given' information (Li 1971).[6] The aspectual restrictions and the affectedness restriction, on the other hand, should form an integral part of the analysis of *ba* licensing. Furthermore these two types of restrictions intrinsically interact. Cheng (1986) also acknowledges a connection between the notion of affectedness and the aspectual structure of the verb phrase. In her account, however, there is nothing inherent in either restriction from which this connection is derived. It is simply stated in terms of feature cooccurrence. Other than Sybesma (1992) whose analysis is discussed below, the only attempts to capture the affectedness restriction (Huang 1991, Cheng 1986) assume that there is a theta role <Affected Theme>.

In this paper, I suggest that the affectedness condition is not the consequence of a thematic role <Affected Theme>, nor is it a subclass of the thematic role <Theme>. Instead, based on Grimshaw (1990), I propose that it derives from an independent hierarchy of semantic roles distinct from thematic roles. Furthermore this second hierarchy is derived from the aspectual structure of the verb constellation. The interaction of the two restrictions on *ba* therefore derives from this relationship between the semantic hierarchy and aspectual structure.

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[6] A reviewer has pointed out that the definiteness effects in the *ba* construction appear to be much more robust than for other preverbal DPs, and that the explanation for this may well lie in event structure of the *ba* construction, which would fit well with the general approach developed here.

3.1. Aspectual classes and an aspectual ontology

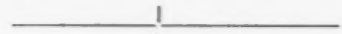
Since Vendler (1967), it has been generally acknowledged that the classification of predicates into aspectual classes accounts for their different behaviour with respect to temporal adverbials and aspect markers. Dowty (1979) details a number of diagnostics for determining aspectual class, and shows that the aspectual class of a clause can be influenced by the arguments of a verb as well as by the verbal constellation. Examples of the four aspectual classes given by Vendler and Dowty are as follows:

- *state* know, love, be tall
- *activity* run, walk, drive a car
- *accomplishment:* kill, paint a picture, build a house
- *achievement* recognise, reach, die

States relate to the traditional stative/non-stative distinction, a distinction which is maintained between states and the other classes, so that the general term for an aspectual class is *eventuality*, reserving the term *event* for the non-stative aspectual classes. Among the events, accomplishments and achievements differ from activities in that they have an *inherent* endpoint, a property often termed *telicity*. This telic/atelic distinction leads to a distinction in past tense aspects between *completion* and *termination* (Smith 1991). A telic verb with its inherent endpoint typically involves completion: the event *John ran to the shops* ends when John reaches the shops. An activity, an atelic verb with no inherent endpoint, simply terminates: *John ran*. Activities and accomplishments differ from achievements in that they involve duration.

Moens and Steedman (1988) develop an ontology of events based on the event structure template of (13) (over) which gives the internal structure of an event. Their proposal is that the different aspectual classes map differently onto this template. The telic property of accomplishments and achievements, mentioned above, is captured by a mapping involving both the culmination and consequent state, the difference between them being that the accomplishment also involves a

(13)



culimination

preparatory process	consequent state

(14)

culimination

preparatory process	consequent state

preparatory process. Hence, the achievement *reach the top* maps as in (14), where the event involves the culmination, i.e. reaching the top, and the consequent state of being at the top. Whereas the accomplishment *build a house* involves the preparatory process of building, in addition to the culmination, the completion of building, and the consequent state, the existence of the house, as in (15).

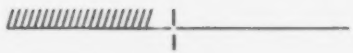
(15)

culimination

preparatory process	consequent state

An activity such as *run*, on the other hand, involves neither culmination nor consequent state, but just the preparatory process part of the template:

(16)



culimination

preparatory process — consequent state

The difference between *termination* and *completion* can now be reformulated as the difference between an event which culminates (completion) and an event that ends before culmination (termination). Moens and Steedman add an additional event to the traditional three; the *punctual* event. This is an instantaneous event which involves only a culmination and neither preparatory process, nor consequent state, for example *sneeze*.

The relationship between the subevents in this template, Moens and Steedman argue, is neither directly temporal nor causal (as proposed in Dowty 1979). Rather they show that it is a relation of *contingency*. In the analysis below, Moens and Steedman's system is adopted as it renders the internal structure of an event transparent, and offers a straightforward approach to the compositional building up of an event.

3.2. Grimshaw's aspectual roles

Grimshaw (1990), in an account of psychological predicates, suggests that there is a dimension of semantic analysis independent from thematic structure which is essentially causal in nature. The two classes of psychological predicates are represented by *frighten* and *fear* which have the same thematic analysis but are distinguished along this dimension: *frighten* is causative whereas *fear* is stative. The importance of this for Grimshaw is that it provides insight into the argument realisation of the two verb classes. In particular, it sheds light on the question of why, in the *frighten* class of predicates, the Theme is realised as the subject despite being lower on the thematic hierarchy. This fact now falls under the broader generalisation that *cause* arguments of causative predicates are always subjects. The causal status of arguments is thus indicative of an independent dimension of

prominence relations that is distinct and autonomous from the thematic dimension:

(17) (Cause(other( )))

It is the alignment (or misalignment) of arguments across the thematic dimension and this causal dimension that yields differing behaviour in relation to argument realisation.

The contentful notion of *cause*, however, is too narrow. Neither agentive predicates, nor unergative predicates, nor psychological predicates show any of the effects of the misalignment of the two semantic dimensions, so their subjects must have some property in common which qualifies them for maximal prominence on the causal dimension. They are not however causatives. How then is this second dimension defined? Grimshaw suggests that the answer lies in the event structure of the predicates and that the dimension is aspectual in nature. Adopting a Vendler/Dowty approach to event structure, Grimshaw suggests that aspectual prominence derives from participation in the subevents of a complex event. For example, an accomplishment such as *break* is a complex event which breaks down into an activity and a state, which in Moens and Steedman's terms, are the preparatory process and the consequent state. (The Dowty/Vendler system does not separate the consequent state from the culmination.)

(18)

Under such an analysis, the cause argument is always associated with the first subevent, the preparatory process. Grimshaw generalises this to the claim that the argument that participates *only* in the first subevent of a complex event is aspectually more prominent than an argument that is associated with both or only the second subevent. I shall continue to refer to the aspectual role (a-role) assigned to that argument as <Cse>, although it should be understood that the causal

interpretation stems not from the a-role itself but from the contingency relation between the two subevents of the complex event, i.e. it is in some sense epiphenomenal.

3.2.1. Aspectual roles in Chinese

Is there any evidence for this independent aspectual hierarchy in Chinese? The causal interpretation of (19) suggests that there is:

(19) wo ba tade chuangkou da-po le.
I *ba* her window hit-broken ASP
I broke her window.

The verb complex in this example, *da-po*, is a resultative compound formed from the two verbs *da* and *po*. The verb *da* means 'hit' and has as its core theta roles Agent and Theme, neither of which has a causal interpretation:

(20) wo da le tade chuangkou.
I hit *le* her window
I hit her window.

The verb *po* is an intransitive verb roughly translating as 'broken', with the single theta role Theme:

(21) tade chuangkou po le.
her window broken *le*
Her window is broken.

If we assume that the thematic structure of the compound *da-po* 'break' derives from the thematic structure of its two component verbs, then the overall thematic structure of the compound will be <Agent, Theme>, that is identical to the thematic structure of *da* 'hit', where the Theme of *da* 'hit' has identified with the Theme of *po* 'broken'. The compound, however, has a causative interpretation that is absent from either of the component verbs. This suggests that the interpretation of the subject of the compound as a Cause cannot be thematic. Turning to the event structure, on the other hand, we find that the compound is an

overt realisation of the preparatory process-consequent state structure, in which the Agent is a participant of only the preparatory process, hence is assigned Grimshaw's a-role, <Cse>. Note that the *object* in (19) has an *affected* interpretation that is similarly absent in (20) and (21). This suggests that affectedness should also not be analysed as a property of the thematic grid as Huang and Cheng have both assumed, but derives from the aspectual dimension. This is the hypothesis addressed in the next section.

3.3. Affectedness, the aspectual dimension and *ba*

The first step in the hypothesis is to look to event structure for a participant that will be interpreted as affected. If this is the case then as well as the a-role <Cse>, we can define a second a-role <Aff>, and the aspectual hierarchy will be specified as:

(22) (Cause(Aff))

Consider the predicate *kill* in the sentence: *John killed the cat.* Here *John* is the <Cse> and *the cat* receives an interpretation as the affected object. If we turn now to the event structure of the predicate, we find that it is an accomplishment comprising a preparatory process, killing, and a consequent state, being dead. In particular we find that while *John* is the participant only of the preparatory process, and hence is assigned the a-role <Cse>, *the cat* is the sole participant of the consequent state. This points to a definition of the a-role <Aff> as the participant of a consequent state. If we look now at the Chinese translation of 'kill' the same appears to be true.

(23) Zhangsan sha le xiaomao.
Zhangsan kill ASP cat.
Zhangsan killed the cat.

Assuming that *sha* has the same lexical event structure as its English translation, *Zhangsan* is the Agent of the preparatory process and *xiaomao* is the participant in the the consequent state. Thus, we find again that the notions of *cause* and *affected* correlate with these roles in the event structure. We can, therefore, abstract away from the

contentful notions of Cause and Affected and work in terms of aspectual subevents and their associated participants. Under this approach, we can now reformulate the affectedness constraint on *ba* in terms of event structure and aspectual roles. More precisely the *ba* DP can be viewed as the participant of a consequent state in a complex event. Thus the object of (23) can appear as a *ba* DP, whereas this is not possible with a verb such as *ai* 'love' that is a state and not a complex event:

(24) Zhangsan *ba* xiaomao sha le.
Zhangsan *ba* cat kill ASP
Zhangsan killed the cat.

(25) *Zhangsan *ba* xiaomao ai.
Zhangsan *ba* cat love

This seems to be a step in the right direction because it does look as though event structure rather than a contentful role is what is relevant. So in the following example, the object could not be said to be affected in any way, and yet *ba* fronting is licensed:

(26) ta ba yaoshi diu-le.
he *ba* key lose ASP
He lost the key.

The claim that *ba* picks out the participant of the consequent state in a complex event entails that a verb like *diu* 'lose' must be argued to be a complex event, having a consequent state, 'lost', that is predicated of the *ba* DP. Evidence for this comes from adverbial modification. If (26) is modified by an adverb of duration *sange xiaoshi* 'for three hours', the only interpretation available is that the consequent state of the key being lost lasted for three hours:

(27) ta ba yaoshi diu-le sange xiaoshi.
he *ba* key lose ASP three hours
He lost the key for three hours.

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In fact, a comparison between the verbs that do allow *ba* fronting with the ones that do not, indicates that the feature that distinguishes the verbs that allow *ba* fronting is that their event structure involves a consequent state when the verb is combined with the aspect marker *le* (*le* is ambiguous between termination and completion). Examples are verbs such as *chi* 'eat', *xi* 'wash', *si* 'tear up', *wang* 'forget', *pian* 'cheat'. The verbs that do not allow *ba* fronting on the other hand all seem to be either states such as *renshi* 'know', or atelic processes such as *ting* 'listen', which either do not perfectivise (in the case of states) or involve only termination where the perfective *le* is licensed. The following are examples of verbs that do not generally license *ba* fronting: *tui* 'push', *shang* 'go up', *dai* 'carry', *xihuan* 'like'.

3.4. V-V compounds, consequent states and *ba*

The idea that *ba* picks out the participant of the consequent state of a complex event is supported by data from V-V compounds. There are two kinds of V-V compounds, conjunctive and resultative (Li 1990). The conjunctive ones are like *bangzhu*, where both halves of the compound mean *help*. They are all either punctual or processes, and do not break down into subevents. The resultative compounds are like overt realisations of the preparatory process--consequent state structure of the lexical complex events. So for example, *chi-guang* 'eat-empty' involves the process of eating and the consequent state in which the bowl is empty, and *chi-bao* 'eat-full' involves the process of eating and the consequent state of the eater being full:

(28) wo chi guang le fan.
I ate empty ASP rice
I ate up all the rice.

(29) wo chi bao le fan.
I ate full ASP rice
I ate rice and ended up full.

If *ba* picks out the participant of the consequent state, then we would expect *ba* fronting of the object to be licensed with *chi-guang* 'eat-empty', where the consequent state is predicated of the object *fan*,

and not with *chi-bao* 'eat-full', where the consequent state is predicated of the matrix subject. This expectation turns out to be correct:

(30) wo ba fan chi-guang le.
I *ba* food eat-empty ASP
I ate up all the rice.

(31) *wo ba fan chi-bao le.
I *ba* food eat-full ASP

Thus we can explain why it is that where the interpretation of the V-V compound is ambiguous, as with *qi-lei* 'ride tired', *ba* fronting is licensed, but yields only the interpretation where *lei* 'tired' is predicated of the object:

(32) a. wo qi lei le neipi ma.
I ride tired *le* that horse
either: I rode that horse and it got tired.
or: I rode that horse and got tired (myself).

but

b. wo *ba* neipi ma qi-lei le.
I rode that horse and got it tired.

3.5. Aspectual role assignment and functional heads

So far it is claimed that the *ba* DP occupies a particular position in the event structure of the clause. This is implemented using Grimshaw's notion of an aspectual hierarchy. In particular, the *ba* object must realise the second most prominent role in the aspectual hierarchy, i.e. <Aff>. Furthermore, this information must be part of the syntactic representation of the *ba* construction. So how can *ba* be specified to pick up the second role in an aspectual structure? Recall that *ba* is claimed to be a thematic mediator, parallel to the analysis of the coverbs given in Rhys (1992). It is thus a functional head with a VP complement, licensing the thematic roles from its VP complement via

its own argument structure. Given this structure, I propose that *ba* actually assigns both <Cse> and <Aff>; <Aff> to the DP in the specifier position of its VP complement, and <Cse> to its own specifier. In other words, by analogy with thematic roles, it has the a-role structure (Cse(Aff)).

In fact, I will adopt the strong claim that a-roles are not assigned at all by lexical heads but only by functional heads such as *ba*. Thus the ambiguity in example (32) (repeated here) arises because no a-roles are assigned:

(32) wo qi lei le neipi ma.
I ride tired le that horse
either: I rode that horse and got tired.
or: I rode that horse and it got tired.

Since no a-roles are assigned here, neither DP is explicitly marked as the participant of the consequent state. When *ba* is projected, it assigns the a-role Aff which explicitly marks the *ba* DP as the participant in the consequent state. Assuming the requirement of the standard Theta Criterion that all arguments must be assigned a thematic role, a-role assignment is not sufficient to satisfy the Theta Criterion, so the *ba* DP has to receive its thematic role from a lexical head. This explains the conflict between the apparent semantic content of *ba*, and the evidence that the *ba* DP receives its thematic role from the verb. *Ba* does have independent semantic content but it is aspectual and not thematic. Effectively what *ba* does, then, is assign aspectual prominence relations, which interact with the event structure of its complement. In other words, by virtue of the a-roles that it assigns, *ba* requires that the event structure of its complement VP be a complex event.

This is somewhat different from Grimshaw's approach in that a-roles here are syntactically and not lexically assigned. In Grimshaw's approach aspectual prominence relations are a lexical feature on an argument derived from the lexical representation of the event structure of a lexical head. In the Chinese data that we are considering here, the event structure of the predicate is not lexical, but rather is built up compositionally as part of the syntax. A-roles therefore cannot be part

of the lexical representation of the thematic role assigning head. In fact, even in Grimshaw's system it transpires that the representation of the aspectual structure cannot simply be projected from the lexical semantic representation of the individual predicate, but involves the projection of an abstract event structure template that breaks down into two subevents: an activity and a state or change of state. Aspectual prominence is determined on the basis of participation in this abstract event template. The difference between the two approaches thus reduces to the level at which the template applies.

Under this analysis we now have an explanation for the following difference in interpretation between a sentence with the object in canonical postverbal position and the corresponding *ba* construction, observed by Sybesma (1992).

(33) wo qi lei le neipi ma.
I ride tired ASP that horse
I rode that horse and it got tired.

(34) wo ba neipi ma qi lei le.
I *ba* that horse ride tired ASP
I rode that horse and *got it* tired.

The difference between the two sentences relates to causativity in that there is a stronger causal interpretation in the sentence involving *ba* fronting. Recall that the relationship between subevents in the Moens and Steedman template is one of contingency. The semantics of the resultative compound, however, further specifies the relationship as one of causation. In example (33), we therefore have a relation of causation between the preparatory process of riding, and the consequent state of being tired. However, no a-roles are assigned and the causation is interpreted as a relation between events. In (34), on the other hand, the a-roles are explicitly assigned and the causation is relation between the participants of the subevents, since the subject is marked as the Agent of the causation, the Cse, as well as the thematic Agent, and the *ba* DP is marked as the Aff. In this way, explicit assignment of the a-roles in a causal complex event will yield a stronger causal interpretation.

4. V-V compounds and argument structure

Whether in the V-V compound the consequent state is predicated of the subject or the object of the process or is ambiguous is not a linguistic issue; it is world knowledge not syntax that tells us that in example (29) rice cannot be full. The fact that the consequent state has to be predicated of one of the arguments of the first subevent is however a matter of syntax. Li (1990) suggests that it is Case restrictions that force argument identification. However, this fails to account for the restrictions on licensing (see the discussion in Rhys 1992). Assuming, however, that identification has somehow been forced, the extension of Grimshaw's system developed here gives us the argument structure of the V-V compound. So, for the V-V compound *qi-lei* 'ride-tired', one interpretation is that the horse being ridden ends up tired, in other words, the Theme of *ride* identifies with the experiencer of *tired*. I will represent this as follows, where the indexes attached to the thematic roles refer to the subevents that the arguments participate in, i.e. 1 is the preparatory process, and 2 is the consequent state:

(35) qi lei
Ag-1, Th-Exp-1+2

This means that the Agent is higher in the aspectual structure than the Theme, because it participates only in the preparatory process. In other words, in terms of the aspectual hierarchy (Cse(Aff)), the Agent is compatible with the <Cse> role. The Th-Exp then is the participant of the consequent state and can be assigned the a-role <Aff>. We thus capture the fact that *ba* fronting of the object is licensed under this interpretation.

So what about the alternative interpretation where the Agent identifies with the Experiencer?

(36) qi lei
Ag-Exp-1+2, Th-1

Reading the aspectual prominence relations directly from the indices assigned to the thematic roles, we find that the change in interpretation also yields the reverse aspectual prominence relations. It is the Theme

that participates only in the preparatory process, whereas the Agent is identified with the Experiencer and so participates in both subevents. The <Aff> aspectual role therefore cannot be assigned to the Theme, which is now highest on the aspectual rating. The fact that *ba* fronting of the object is not available for this interpretation is thus captured. However, Grimshaw's system for assigning aspectual prominence also predicts that the Theme should be licensed as subject since it is only associated with the first subevent, and the specification of *ba* predicts that the Agent-Exp should be licensed as a *ba* object. This is because it is indexed as the participant of the consequent state and therefore should satisfy the a-role <Aff>. This prediction holds and the following example is acceptable:

(37) ma *ba* wo qi lei le.
horse *ba* I ride tired ASP
The horse tired me out riding it.

In fact, this arrangement of thematic and aspectual relations yields precisely the set of examples which Sybesma calls the *causative ba* sentences.

(38) Zhei-jian shi ba Zhang San ku-lei le.
This-CL case *ba* Zhang San cry-tired ASP
This thing got Zhang San tired from crying.

(39) ku-lei
Ag-Exp-1+2, Th-1

In fact, under this system we also get some explanation for the ergativity shift phenomenon that Sybesma discusses. Sybesma argues that the *ba* construction involves an abstract CAUS predicate which gets phonological content either by V raising or by insertion of *ba* which he claims is a dummy element. An important feature of his analysis is the claim that the complement of this abstract CAUS predicate is ergative. Adopting Hoekstra's (1988) account of resultatives, Sybesma essentially claims that the resultative V-V compounds involve at D-structure a matrix verb with a resultative

complement and *assumes* that the resultative complement triggers a shift to ergativity in the matrix verb, suppressing the external argument of the matrix verb. The test for ergativity in Chinese is the postverbal subject. Hence, while *ku* 'cry' does not license its subject postverbally in (40), in the resultative compound *ku-lei* 'cry-tired', he claims it does:

(40) *ku le yixie hao ren.
cry ASP some good people
(intended: Some good people cried.)

(41) ku-lei le yixie hao ren.
cry-tired ASP some good people
Some good people cried themselves tired.

Similarly:

(42) ku shi le shoujuan.
cry wet ASP handkerchief
The handkerchief got wet from crying.

Under my system, it is no surprise that such examples are ergative. In the mapping from aspectual structure to argument structure, Grimshaw argues that ergative/unergative distinction relates to whether the single argument predicate maps onto the first or second subevent of the event template. A single argument predicate that maps on to the first subevent, the preparatory process, will be unergative, whereas the single argument predicate that maps onto the second subevent, the consequent state, will be ergative. In fact, exactly what this predicts for (41) is not clear, since it maps on to both subevents and the single argument is associated with both subevents. This is reflected in native speaker judgements, which are divided over whether (42) necessarily involves an implicit Cause argument, in which case, the predicate is not ergative but transitive. In (42) on the other hand, the predictions are clear. Since the only argument expressed is associated with only the consequent state, it will be licensed as the internal argument and the overall predicate will be ergative.

5. Resultative complements

This analysis also carries over to the phrasal resultative using the particle *de*. In this construction a consequent state is expressed by a clause in complement position introduced by *de*, which is cliticised onto the matrix verb:

(43) ta qi de ma hen lei.
she ride *de* horse very tired
She rode so much the horse got tired.

(44) ta qi de hen lei.
she ride *de* very tired
She rode so much she got tired.

In the examples above, there is no matrix object competing with the resultative complement. Where the matrix object is expressed in this construction, fronting of the object is obligatory, by the Postverbal Constraint, as the resultative complement saturates the postverbal complement position. However, the fronted object can be licensed preverbally either by *ba* or by verb reduplication, and the different licensing mechanisms trigger different interpretations. Adopting Huang's (1991) insight that these resultative constructions are, at some level of representation, complex predicates, they are assigned a complex event structure parallel to the lexically formed V-V compounds. Again licensing by *ba* forces the reading where the *ba* DP is the participant of the consequent state. Compare:

(45) wo ba ma qi de lei le.
I *ba* horse ride *de* tired ASP
I rode the horse and got it tired.

(46) wo qi ma qi de lei le.
I ride horse ride *de* tired ASP
I rode the horse and got tired.

The reason that the resultative construction is important to the study of *ba* is that *ba* fronting of the subject of the resultative

complement is licensed even where the DP in question is clearly an argument only of the embedded clause and not of the matrix clause:

(47) wo ku de Zhangsan hen shangxin.
I cry *de* Zhangsan very sad
I cried so much that Zhangsan was very sad.

(48) wo ba Zhangsan ku de hen shangxin.
I *ba* Zhangsan cry *de* very sad
I cried so much that Zhangsan was very sad.

The matrix verb in these sentences is *ku* 'cry' which on its own does not license an object, either in canonical object position or as a *ba* DP:

(49) *wo ku le Zhangsan.
I cry ASP Zhangsan

(50) *wo ba Zhangsan ku le.
I *ba* Zhangsan cry ASP

The *ba* DP must therefore be theta marked in the embedded clause. This is a property *only* of resultative complements; other embedded clauses do not permit *ba* fronting of their subjects. While this is problematic to explain for purely syntactic accounts of *ba*, these facts simply fall out from the aspectual account of *ba* that I have developed here.

In general there is, for every V-V compound, a corresponding resultative construction. However, there is a difference in interpretation between the V-V compound and the resultative construction relating to causality. In the same way that *ba* fronting in a V-V compound yields a stronger causative interpretation than the non-*ba* fronted form, so the resultative compound has a stronger causative interpretation than its V-V compound counterpart:

(51) a. wo qi lei le neipi ma.
I ride tired *le* that horse
I rode the horse and it got tired.

b. wo qi de neipi ma lei le.
I ride *de* that horse tired *le*
I rode that horse and got it tired.

The particle *de* thus clearly does have some semantic content. In particular, it has a similar semantic effect to *ba*. In the following analysis I adopt Huang's basic intuition that the resultative construction forms a complex predicate with the matrix verb, but I argue that this is a property of the event structure and not syntactic as Huang assumes. A detailed analysis of *de* resultatives is however beyond the scope of this investigation. What we are interested in here is the interaction of the resultative complement with *ba* and with the event structure of the sentence.

5.1. Resultative *de* and event structure

The basic claim here is that *de* is a functional head which combines with its complement and with the matrix clause to form a complex event. More precisely, there is, as part of the semantic representation of *de*, a rule that essentially means that *de* combines two independent events, to yield one complex event. Using bracketing to mark subevents this can be represented as shown:

(52) (e1) de (e2) → (E(e1)(e2))

This captures Huang's intuition that these are complex predicates without forcing unmotivated abstraction in the syntax. Under this analysis, it is a complex predicate in that it yields a single complex event. This interaction of *de* with event structure is reflected syntactically in that *de* is also an a-role assigner assigning the two a-roles (Cse (Aff)). In fact, it may be possible to derive the rule in (52) from the a-role structure of *de*. It assigns the a-role <Aff> to the DP that it governs in the subject position of the resultative clause, and assigns the most prominent a-role <Cse> to the subject of the matrix clause.[7] If both *de* and *ba* are projected, the a-roles are forced to identify

[7] Note that I am only claiming an aspectual parallel between *de* and *ba*. Hence, we would not necessarily expect parallel behaviours in other

as they map onto to the same complex event. The only difference in interpretation is one of causality; there is a stronger causal interpretation when both functional heads are projected. This, as we have seen, can be attributed to the relationship between causality and the a-roles assigned. Apart from this, the following have the same interpretation:

(53) a. Zhangsan ku de Lisi hen shangxin.
Zhangsan cry *de* Lisi very sad
Zhangsan got Lisi sad with his crying.

b. Zhangsan ba Lisi ku de hen shangxin.
Zhangsan *ba* Lisi cry *de* very sad
Zhangsan got Lisi sad with his crying.

These two have the same interpretation because the DPs in question are assigned the same a-roles. This suggests an explanation for the following, otherwise confusing, observation. Where the matrix verb has both a transitive and an intransitive reading but there is no matrix object, the matrix verb is nonetheless interpreted transitively and the subject of the resultative is necessarily interpreted as the matrix object:

(54) Zhejian shi jidong de Zhangsan ku le.
This matter excite *de* Zhangsan cry *le*
This matter excited Zhangsan so much that he cried.
not: This matter was so exciting that Zhangsan cried.

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respects. For example, a reviewer has pointed out that while the *ba* DP must be overt, the DP following *de* can be empty. There are a couple of potential sources for this difference. Huang 1984 shows that empty complements are in fact instances of wh-movement, whereas empty subjects can be pro. Furthermore, only *ba* is a thematic mediator. So essentially, the question seems to boil down to why a thematically mediated argument cannot be wh-moved. Note that this is true for all the coverbs which I have argued should be analysed as thematic mediators in Rhys 1992.

As is seen from the translation, although the matrix verb *jidong* 'excite' appears to be used intransitively, it must be interpreted transitively with the meaning *excited Zhangsan*. This can be understood as the effect of the a-role assigned to Zhangsan; which is canonically realised as an object. It also explains the marked preference for the corresponding *ba* fronted sentence.

This analysis in terms of a-roles explains both the object interpretation of the subject of the resultative and the availability of *ba* fronting. It also captures the parallel causality effects of the resultative complements and *ba* fronting in the V-V compounds.

6. Why do we need to refer to the internal structure of the event?

Until now, we have been referring to the internal structure of an event. However, the eventuality involved in the *ba* structures we have addressed so far is always an accomplishment with a fixed internal structure. If this is the case, then do we really need to build so much structure into the analysis? Or could the analysis simply make reference to the aspectual category of accomplishment, rather than the consequent state in a complex event? For example, one could imagine an analysis in terms of the object of an accomplishment formed by a simplex, or complex predicate.

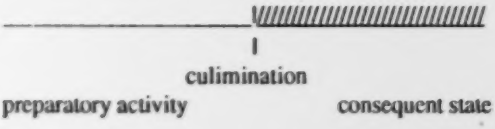
One response to the criticism that the account is building more structure than is necessary might be to point to other linguistic phenomena that require reference to the internal structure of the event. Grimshaw's work on argument structure in English discussed above, for example, requires reference to the internal structure of the event via an event template. Stronger motivation, however, comes from the *ba* construction itself. In the following data, examples are given in which the *ba* construction is licensed, but the eventuality involved is clearly not an accomplishment. Such data would obviously cause problems for an analysis in terms of accomplishment. However, the internal structure of the event does involve a consequent state as expected under this analysis.

6.1. Inchoatives

A frequently observed counterexample to the claim that *ba* is only licensed in accomplishments is the following:

(55) wo ba ta ai shang le.
I *ba* her love PRT ASP
I fell in love with her.

The aspectual classification of such an utterance is inchoative, where inchoatives are thought to pick out the begining part of the event. What then is the internal structure of an inchoative? Going back to the Moens and Steedman template, inchoatives are also analysed as involving a culmination and consequent state.



The difference between the accomplishment and the inchoative is that the culmination in the inchoative marks the *initial* bound of the event, whereas in the accomplishment it marks the final bound (Moens p.c., Kamp p.c., Dowty 1979). Thus, in an example such as (55), the culmination is the falling in love and the consequent state is the being in love. We can show that the consequent state is indeed part of the linguistic representation of 'fall in love' by the contradiction in (56), where the entailed consequent state is negated:

(56) ! I fell in love with her but I never loved her.

Thus the inchoative is clearly shown to involve a consequent state, which would lead us to expect that *ba* fronting with inchoatives is licensed.

6.2. Progressive - *zhe*

Another apparent counterexample to the descriptive restriction of *ba* to bounded events is the use of *ba* with the progressive marker *zhe*.

(57) ta ba yifu bao-zhe.
he *ba* clothes bundle-PROG
He is bundling up the clothes.

At first blush, such an example appears to be an irredeemable problem for the account of *ba* given here. However, appearances can be deceptive and in this instance, it is the translation of *zhe* as a progressive, that leads to the deception. In fact a much more appropriate translation would be as a resultative along the lines of 'He has the clothes bundled up' with the resultative particle 'up'. In fact, Carlota Smith argues very convincingly that 'in its basic meaning *-zhe* is a resultative stative' (Smith 1994: 122).

The common representation of *zhe* as a progressive stems from its additional use as a backgrounding particle, in examples such as the following:

(58) Xiao Li zuo zhe kan shu.
Xiao Li sit *zhe* read book
Xiao Li is reading sitting down.

In this use *zhe* loses the resultative interpretation, and has a simple activity reading with no internal structure at all. If the analysis of *ba* given here is correct, we would predict then that *ba* fronting with the backgrounding use of *zhe* is not licensed. And indeed, the data in (59) shows that this is the case:

(59) *Xiao Li ba yifu bao zhe chang ge.
Xiao Li *ba* clothes bundle *zhe* sing song.

Thus again we find that it is the specification of *consequent state* that is crucial to the distribution of *ba*.

6.3. Directionals

An additional interesting result arises with examples such as the following from Wang (1987):[8]

(60) ta zhengzai ba chuan wang shui li tui
she now *ba* boat towards water in push.
She's pushing the boat into the water.

It is generally assumed to be the case since Vendler (1967) that an activity verb with a goal yields an accomplishment, e.g. *run to the park*, whereas an activity verb with a directional adverb or complement remains an activity, and this can be tested for using Dowty's time adverbial tests, where *in*-adverbials are appropriate with accomplishments but not with activities. Hence:

(61) a. Michelle drove to the university in five minutes flat.
b. ?Michelle drove towards the university in five minutes flat.

Activity verbs with directionals are not, however, straightforward activities, hence the oddness of (62a) as compared to (62b):

(62) a. ?Michelle drove towards the university for five minutes
b. Michelle drove around the university for five minutes.

(62a) is by no means ill-formed but does seem to require some contextual explanation, hence the improvement in (63):

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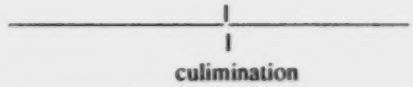
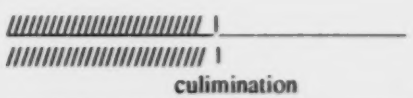
[8] Note that this example provides counterevidence to the common assumption that *ba* fronting is not licensed with monosyllabic verbs, based on examples such as the following:
(a) *wo ba ni sha.
I *ba* you kill.
This is judged as unacceptable, but becomes acceptable combined with the aspectual particle *le*. This not, in fact, a question of syllabicity, but rather of event semantics, since the same expression is licensed in a conditional:
(b) ruguo wo ba ni sha, ...
If I *ba* you kill, ...
Thus, the explanation for (a) will be in terms of event semantics and compatible with the approach to *ba* developed here.

(63) Michelle drove towards the university for five minutes before changing her mind and turning back.

We can begin to get a handle on the difference between the simple activity in (62b) and the activity plus directional in (62a), by referring again to Moens and Steedman's event template:



The simple activity in (62b) involves just the first part of the template, the activity part, and terminates, but has no culmination, as follows:



The activity plus directional also refers to the activity part of the template, but in addition it provides information about the consequent state that would be reached if the event culminated rather than simply terminating. That is, although a presupposition of (62a) is that Michelle does not end up at the university, it is also true to say that part of the meaning of (62a) is that if the activity of Michelle driving towards the university does not terminate, then there is an inherent culmination point, the arrival at the university, and the consequent state of being at the university. In other words, the consequent state is not entailed but can be inferred, and clearly must be part of the representation of a directional expression.

Accounting for (60), therefore means that we must extend the analysis of *ba* to incorporate not just consequent states that are entailed by the event structure but also ones that can be logically inferred. This might seem like an undesirable weakening of the initial analysis. However, closer examination of the aspectual classes in Chinese

suggests that this is necessary to account for simple lexical accomplishments.

The question of the existence of lexical accomplishments in Chinese is controversial. Based on the following examples, Tai (1984) and Heinz (1984) both argue that in Chinese there is no grammaticalisation of telicity; that is that the culmination and consequent state that are the defining features of accomplishments are not part of the lexical meaning of verbs such as *sha* 'kill'.[9]

(64) wo sha le ta liang ci dou mei si.
I kill ASP her 2 times all not die
I tried to kill her twice but she didn't die.

(65) Zhangsan xue-le Fawen, keshi mai xue-hui.
Zhangsan learn *le* French but not learn-able
Zhangsan studied French but never learnt it.

(66) wo mai le sanben shu, keshi mei mai-dao.
I buy *le* three books, but not buy-arrive
I tried to buy three books but didn't manage to.

Smith (1990) argues that these verbs are telic but that the perfective particle *le* in Chinese does not have the same interpretation as perfective in a language such as English, but is ambiguous between termination (no culmination) and completion (culmination). An alternative approach which avoids the disjunctive analysis of *le* is to argue that the aspectual structure of a lexical accomplishment in Chinese does include a culmination and a consequent state but that the consequent state is not an entailment of the verb and hence is defeasible. The relevance of this problem here is that *ba* fronting is licensed showing that the consequent state required by *ba* need not be an entailment of the predicate:

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9 Native speaker judgements on these examples vary enormously. They are give here in order of decreasing acceptability with only the first being universally accepted.

(67) wo ba ta sha le liang ci dou mei si.
I *ba* her kill ASP 2 times all not die
I tried to kill her twice but she didn't die.

Returning to the example in (60), there would seem then to be independent motivation that a consequent state that is *inferrable* from the directional expression is sufficient to license *ba*.

7. Conclusion

Much of the earlier controversy around *ba* stems from dissension over whether or not *ba* has any independent semantic content. Either *ba* was assumed to be a purely formal particle, the function of which was to assign Case, or it was argued to have semantic content and this was assumed to translate into thematic content. Under the hypothesis that abstract Case does not play a role in Chinese (Rhys 1992), *ba* cannot be a Case marker. However, I have also argued against the second option of assuming thematic content to *ba*. Instead I have argued for a second kind of semantic information that plays a role in syntactic description; namely event structure. I have shown in this paper that the affected interpretation of the *ba* DP is the consequence, not of a particular thematic role, but of the a-role assigned by *ba*. In this way, the constraints on *ba* are captured and shown to be intrinsically linked, and the supposed control facts of Huang (1991) fall out. Furthermore the relationship between *ba* and causality is now understood as a consequence of the contingency relations between subevents of a complex event. The extension developed here of Grimshaw's theory of the interaction between aspectual structure and thematic structure and the consequences for argument structure was shown to predict both the ergativity shift in certain V-V compounds, and the well-formedness of the causative *ba* sentences.

Thus this paper provides further evidence for a model of syntax in which there is considerable interaction between the syntactic representation and the level of event structure, cf. Ramchand (1993), McClure (1994).

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